Shoring

Lesson
topic 3.2

Enabling Objectives

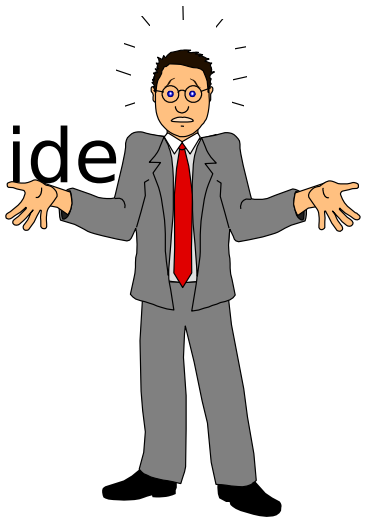
1. Select the procedures to control and repair damage to shipboard equipment and systems
2. Coordinate the activities of the damage control teams of the repair station
3. Select the capabilities and operating characteristics of damage control equipment and systems under normal and degraded conditions

Shoring

- Placing supports against, beneath or above damaged areas
- Prevents additional sagging, bulging, and/or metal fatigue
- Temporary structure

Shoring

- When to shore
  - Good judgement is the best guide
  - Need indicated by
    - Deep bulges in plating
    - Bowed frames and stanchions
    - Cracked seems
    - Panting bulkheads
    - When in doubt

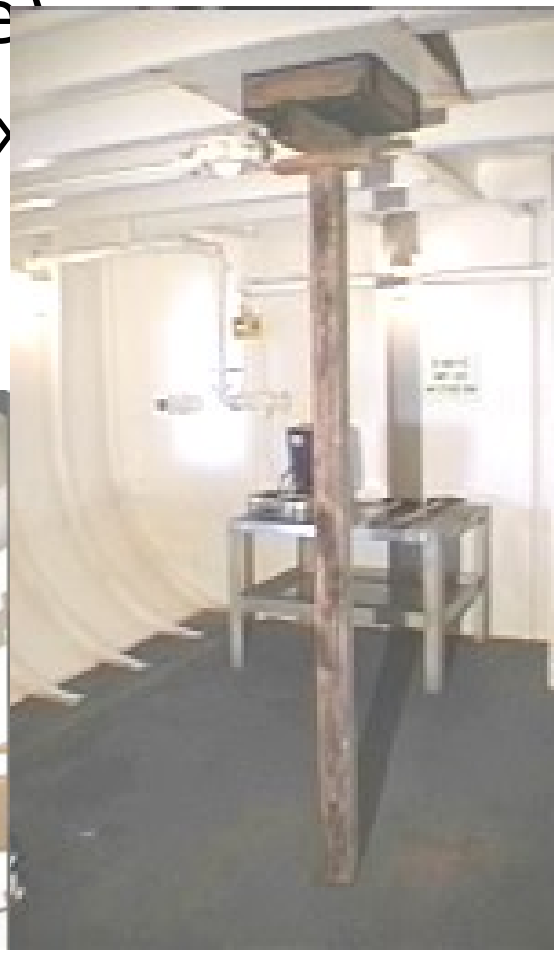


Does this require shoring?

OUCH!!!

Types of Shoring

- Direct compression, (I-Type)
  - Pressure acting parallel to ax
  - Simplest and strongest
  - Vertical or horizontal



Types of Shoring

- Cross-Axial, (H-Type)
  - Pressure acting perpendicularly to axis
  - Moderate pressure

Types of Shoring

- Triangulation, (K-Type)
  - Shores under direct compression
  - Ends cut at 90 degree angles
  - Installed at not more than a 90 degree angle

Types of Shores

- Steel shores
  - Adjustable and telescoping
  - Two sizes
    - Model 3-5 maximum load of 20,000 pounds when closed & 12,000 pounds extended
    - Model 6-11 maximum load of 20,000 pounds when closed & 6,000 pounds extended

Types of Shores

- Advantages of steel shoring
  - Fireproof
  - Stronger than wood
  - Saves space & less complicates to install
  - Weld in place
  - Wedges not required
  - Minimum time to erecting

Types of Shores

- Disadvantages
  - Produces sparks
  - Rust
  - Maintenance required
  - Heavier than wood shores

Types of Shores

- Wood shores
  - Made of soft
    - Douglas fir
    - Yellow pine
    - Hemlock
    - Spruce
- Treatment, Fire resisting chemicals

Types of Shores

- Stowage
  - Stowed in lengths of 16 to 18 feet
  - Distributed throughout the ship
- Working Length
  - Never exceed 30 times its minimum thickness
  - Most common shoring materials are 4” by 4”

Wedges

- Types
  - Wood
  - Steel
- Wood wedges
  - Made of soft wood
    - Douglas fir
    - Yellow pine
  - Tighten and hold shore in place

Wedges

- Rough cut and unpainted
- Width same as shore
- Length of wedge, Six times its butt thickness
- Installation
  - Always used in pairs
  - Rough side to rough sid
  - Driven in simultaneousl

Wedges

- Steel wedges
  - Primarily used for prying
  - Used in conjunction with wood wedges
  - Welded in place

Sholes

- Shole is a flat plate/board which is placed under the end of a shore to distribute weight/pressure
- Types
  - Wood
  - Steel
- Wood shole
  - Soft Wood
  - Thickness at least 1 inch & 8 to 12 inches wide

Strongbacks

- Distributes pressure
- Serves as an anchor
- Same material as sho
- Heavy planks, steel b
  and iron pipe ma
  be used

Tools, hand and powered

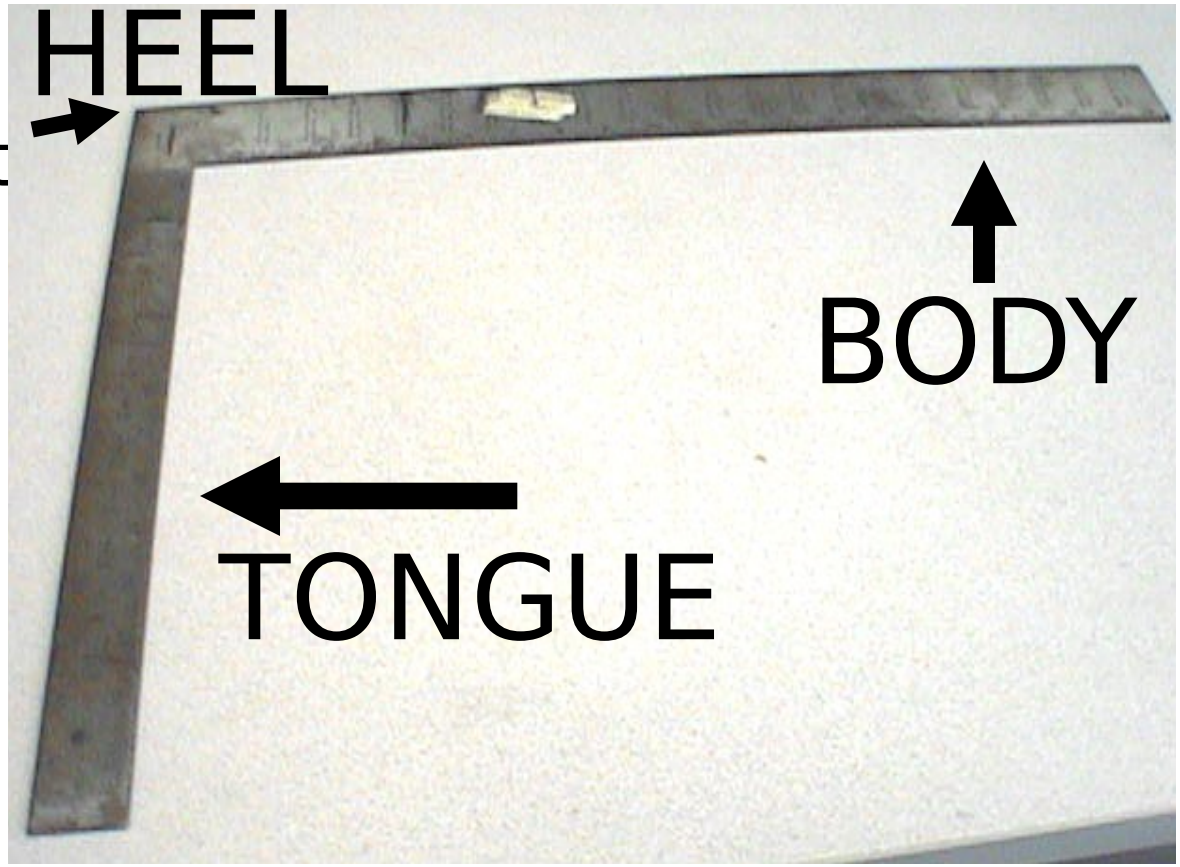
- Tape measure and folding rule
- Carpenters square
- Measuring batten
- Saw both hand and electric
- Mauls, hammers and sledges
- Cutting outfit
- Welding machine

Measuring Batten

- Measuring batten
  - Easiest and Quickest
  - Adjustable
  - 90 degree angles on the ends
  - Take diagonal measurements
  - May lose accuracy

Carpenters square

- Carpenters square
  - Training
  - Three part



Carpenters square

- Use side of square that is divided into 1/12 of an inch
  - 1/12 of an inch equals 1 inch
  - 1 inch equals 1 foot
  - Hold tongue in left hand

Measuring shoring

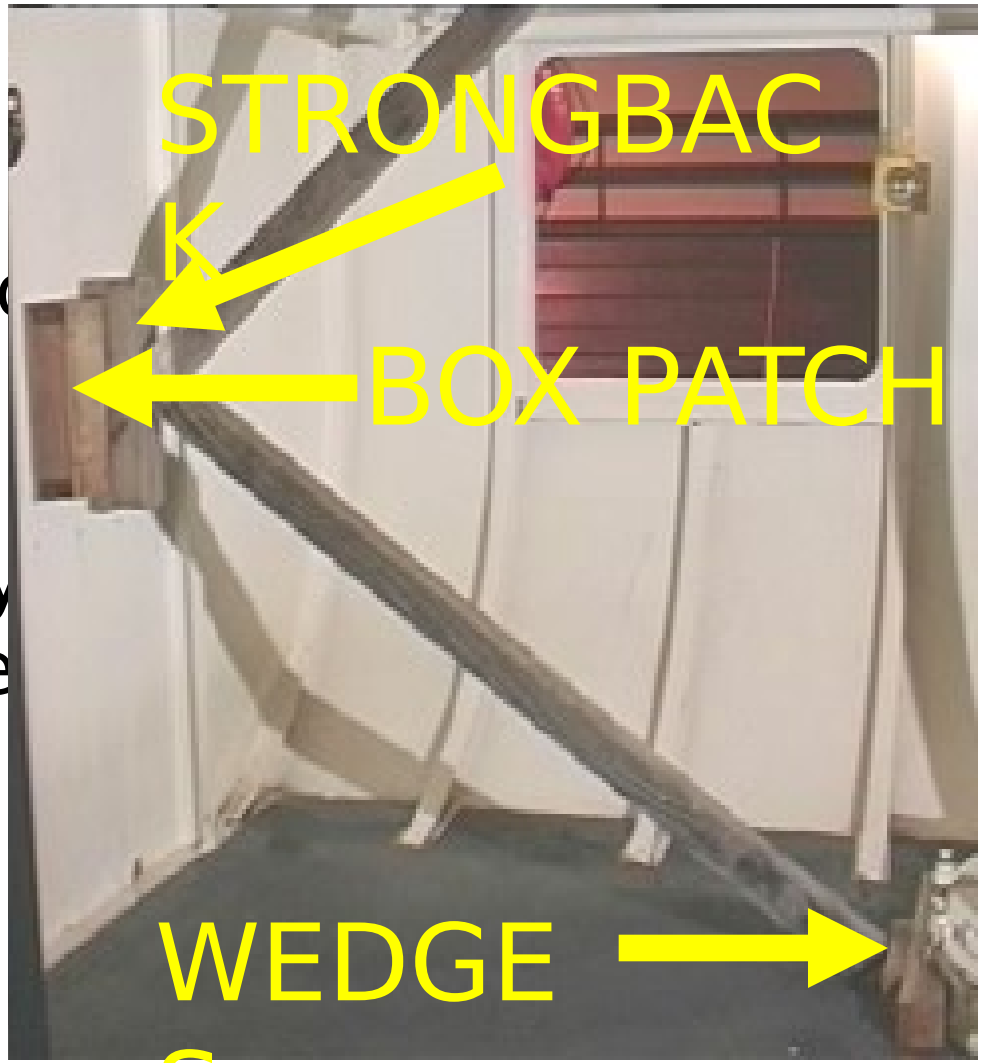
- Rise
  - Deck/overhead
  - measurement goe
    of square

Measuring shoring

- Uncorrected run
  - Bulkhead to the

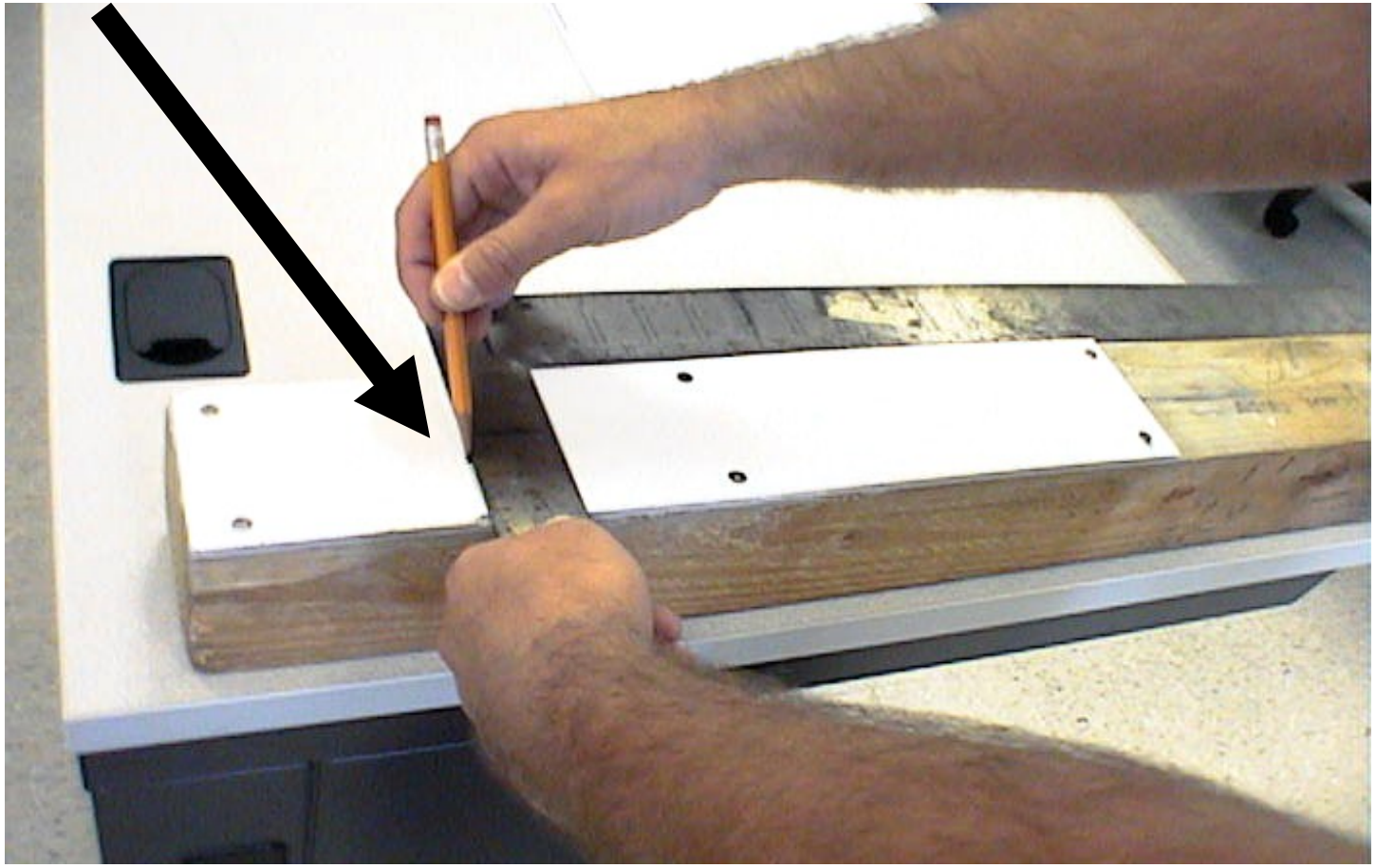
Measuring shoring

- Corrected run
  - compensates for the thickness of strongbacks, wedges, etc…
  - Goes on the body of the square



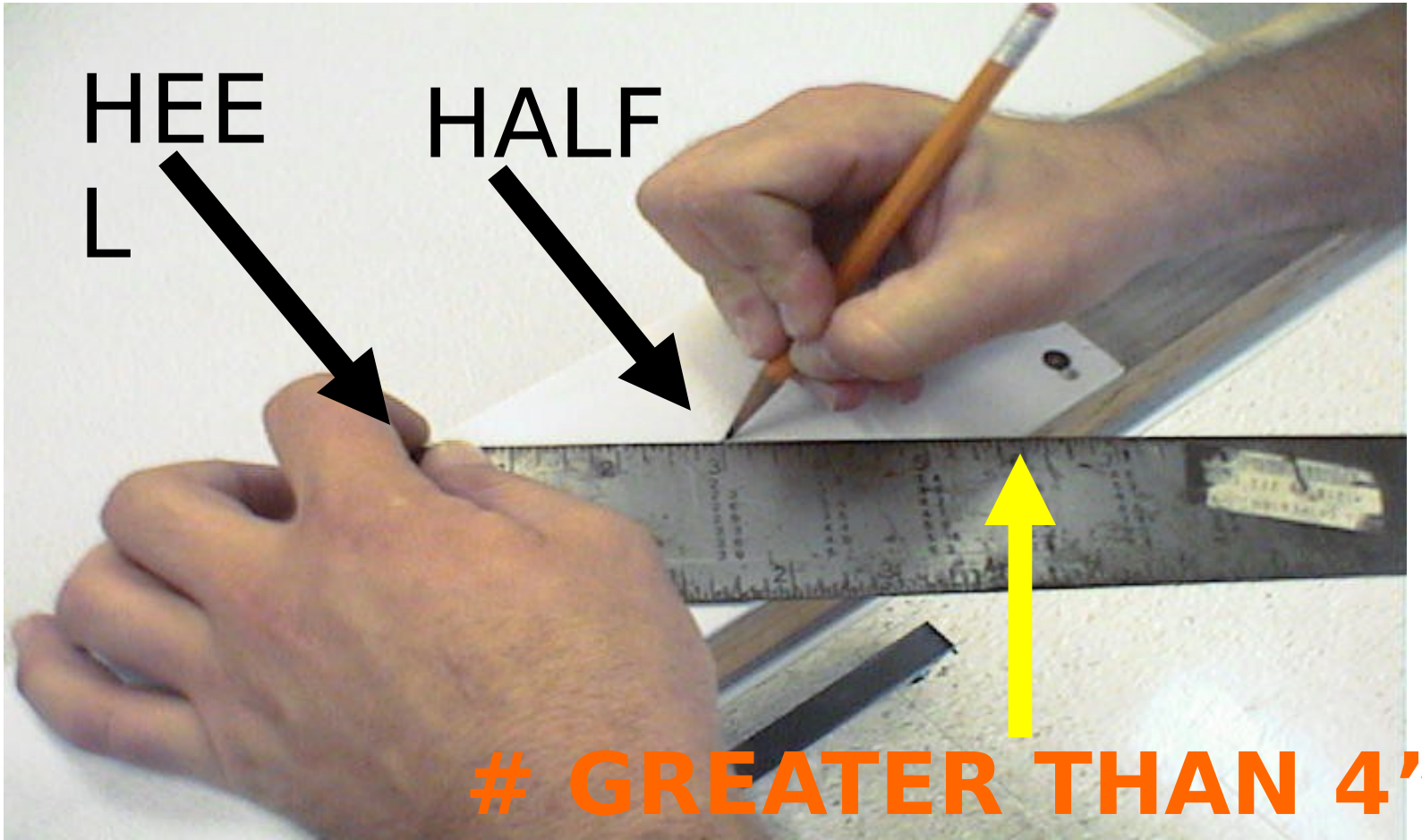
Layout of K type shoring

- Squaring the end



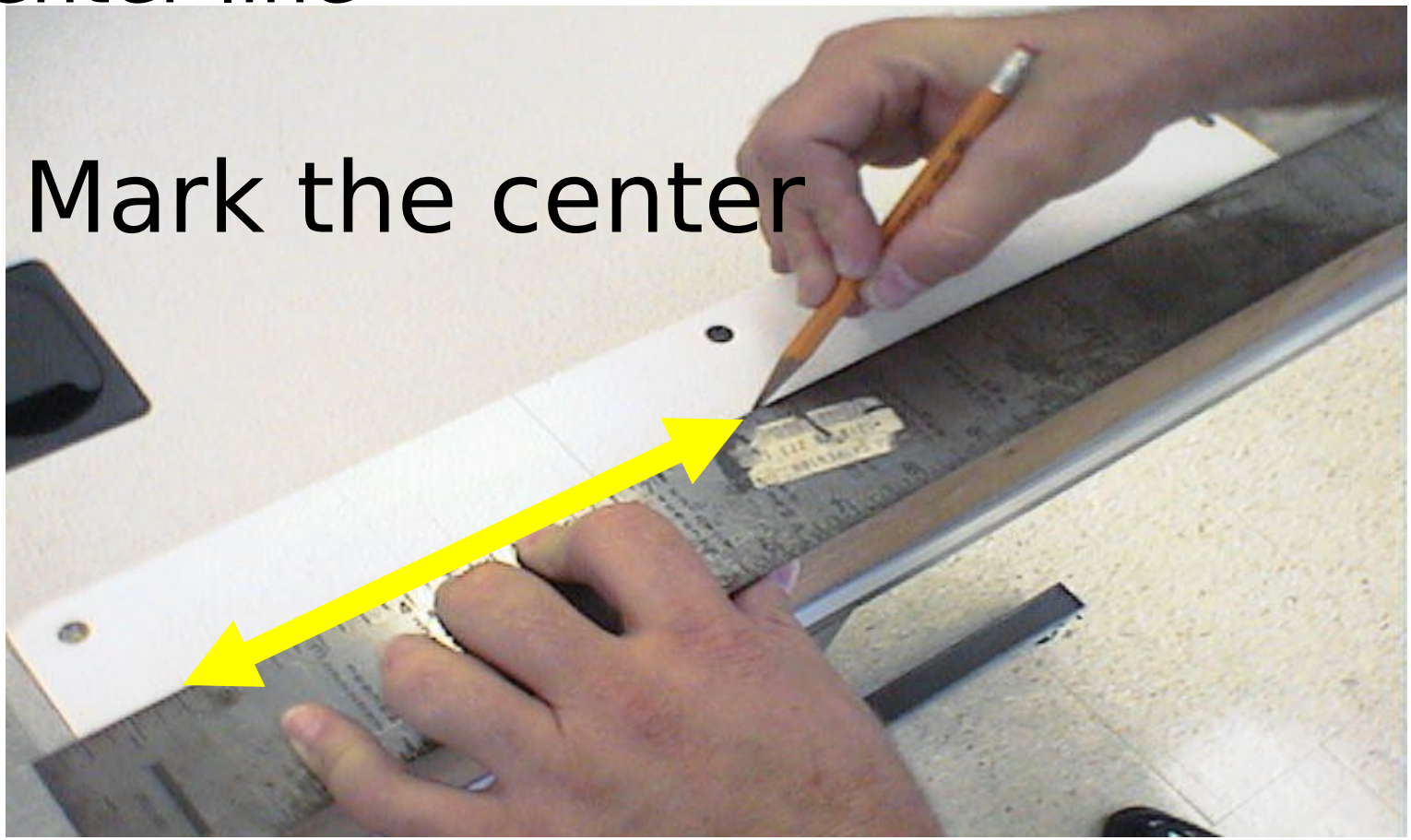
Layout of K type shoring

- Find the center line



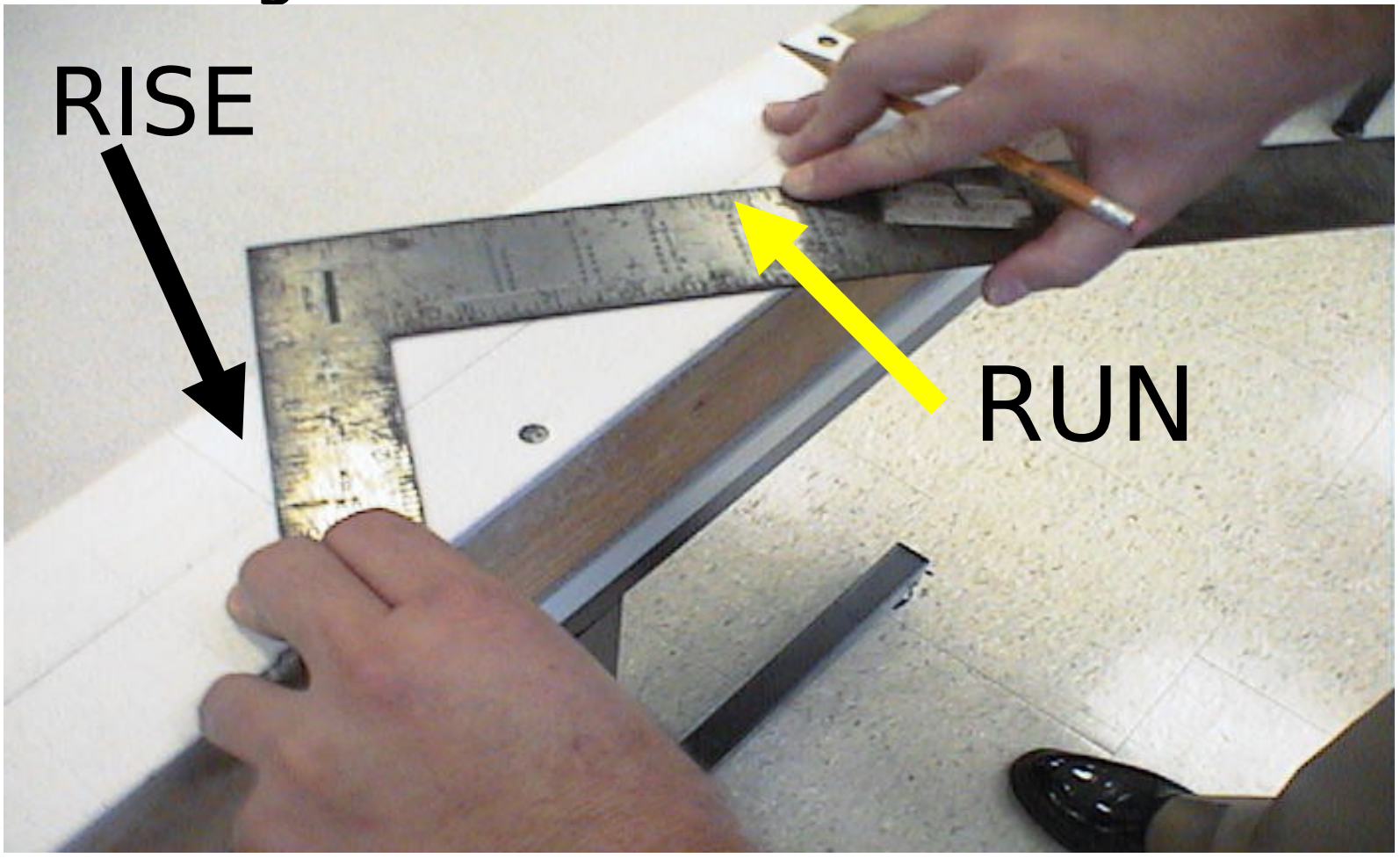
Layout of K type shoring

- Center line



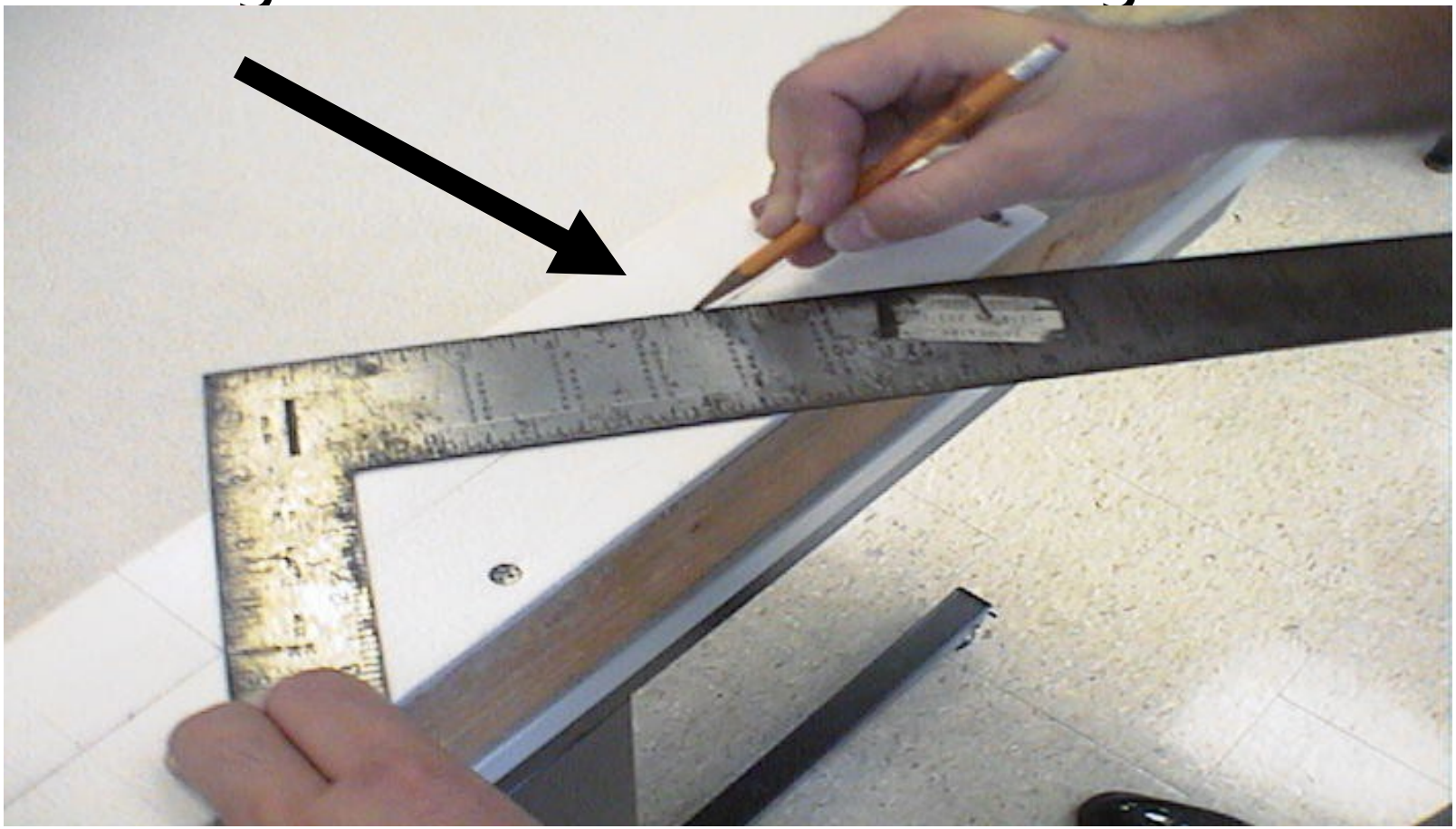
Layout of K type shoring

- Marking the Rise & Run



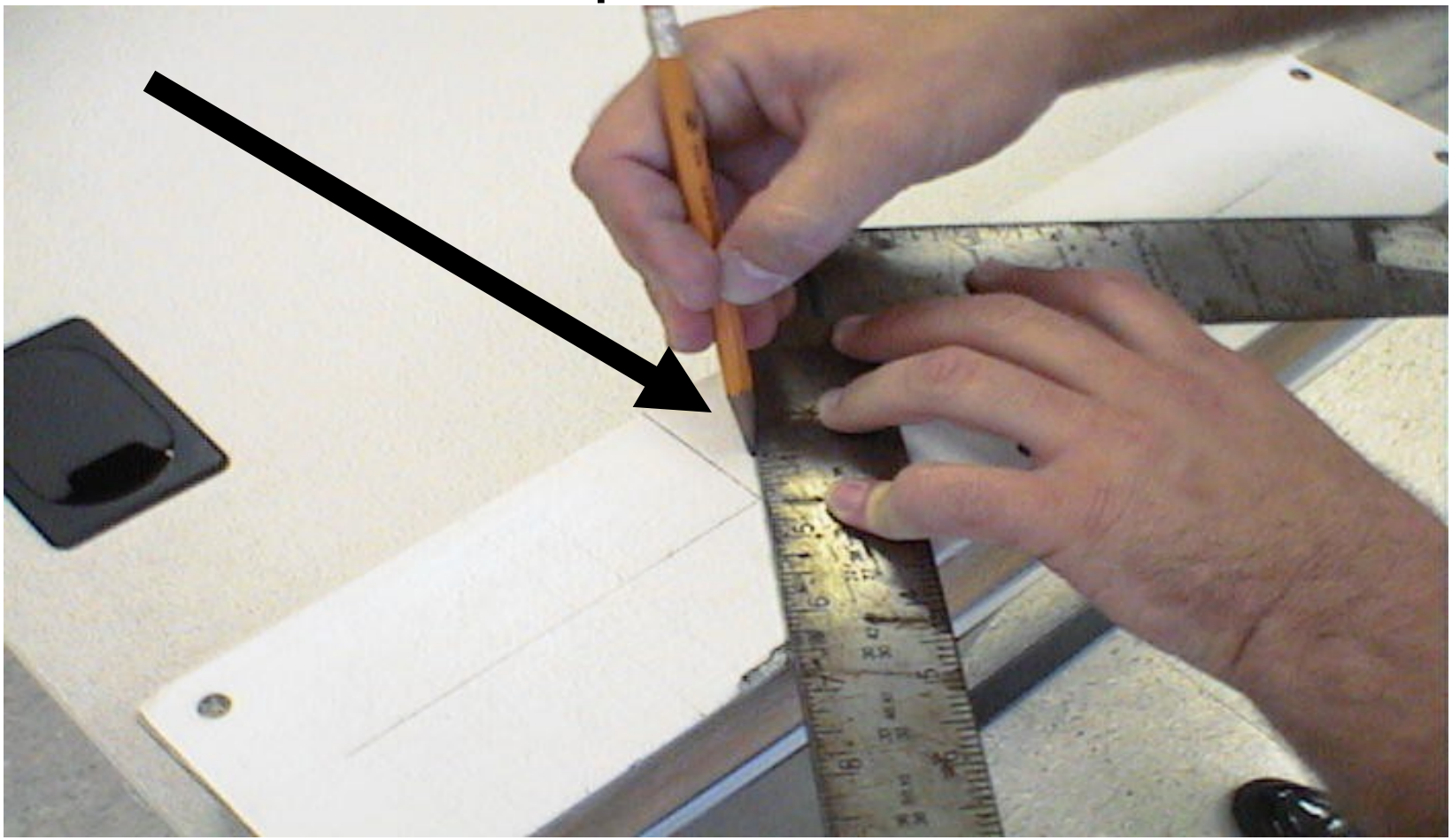
Layout of K type shoring

- Marking the shore for the length



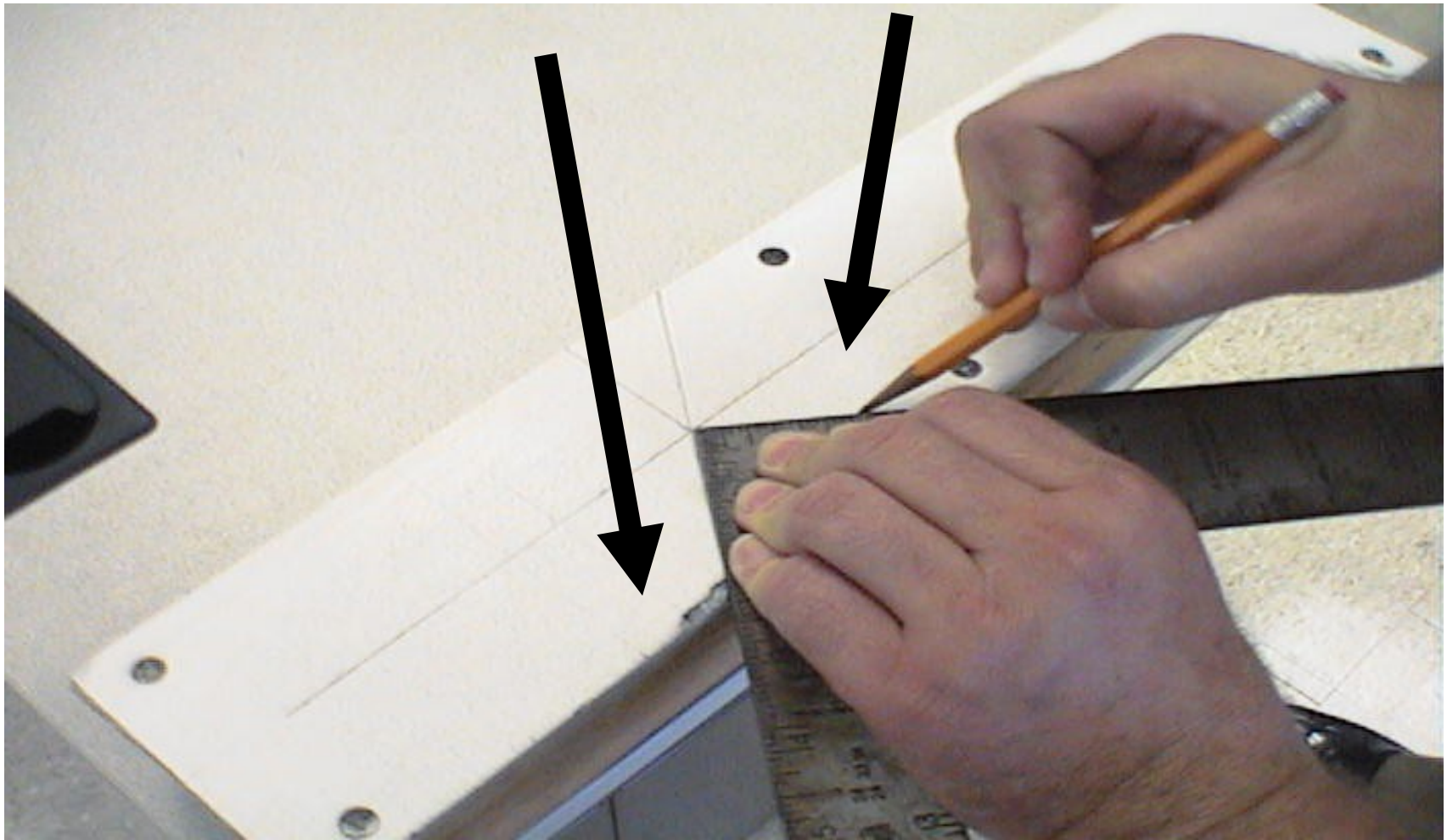
Layout of K type shoring

- Mark front of square



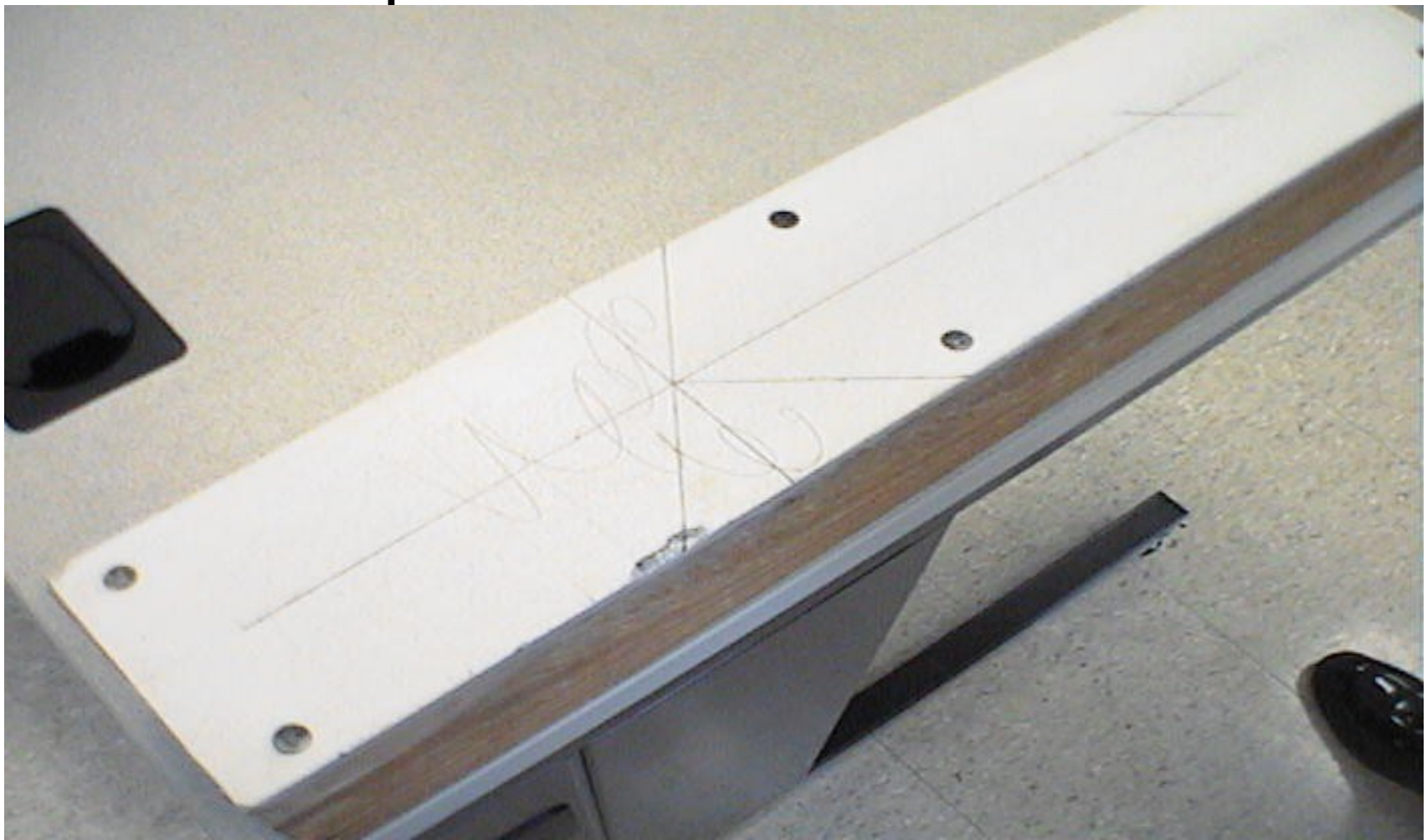
Layout of K type shoring

- Slide square down & mark outside



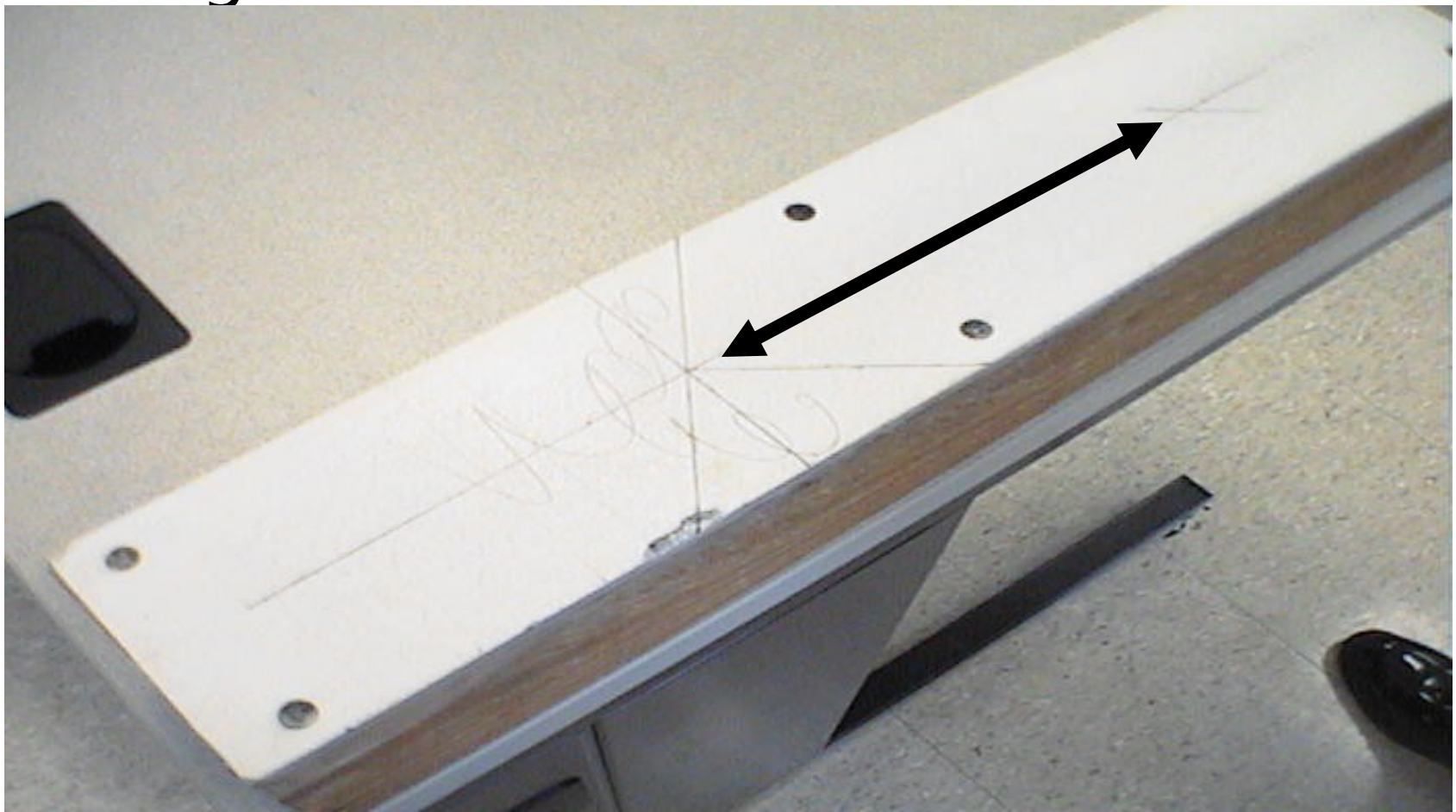
Layout of K type shoring

- Finished product



Layout of K type shoring

- Length of shore



Summary and Review

- When to shore
- Types of shoring
  - I type
  - H type
  - K type
- Types of shores
- Measuring shoring K type shoring